

The Predictive Validity Of Combined SAT Scores On College Graduates Grade Point Averages

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Introduction

Traditional wisdom has held that the Scholastic Aptitude Test (SAT) added considerably to the success of school performance when used to predict college grade-point averages. More recently, many have carefully analyzed the use of the SAT in college admissions decisions. They criticize the alleged redundancy of the test, claiming that it adds very little to the prediction of first-year college grades. Critics point out the biases of the test, stating that its use results in the exclusion of members of certain groups, particularly females and ethnic minorities, whose lower scores cause under-prediction of college success (Coyle, Snyder, Pillow, & Kochunov, 2011). Some smaller institutions function well without the use of the SAT. They use t-tests and ANOVA to determine admissions and predict success.

Larger institutions that must process large quantities of data have found it difficult to discover some valid basis for admissions that is the practical and superior alternative to the combination of high school performance and traditional admissions tests used to predict student achievement. In most institutions, the SAT or other admissions tests are not the only criteria used for making admissions decisions. All institutions of higher learning have some criteria for admission. Their admission policies place them in categories such as competitive, moderately competitive, and highly competitive. These categories are used to help set the admission standards and determine the status of the institutions. Admittance reforms have been put in place that are designed to raise the admissions standards and enable all institutions to be more selective.

Selectivity forces elementary schools and secondary institutions to better prepare students for academic success. Similarly, the outcries from businesses and industries regarding the poor preparation of students entering the workforce impact all learning institutions and force them to upgrade and improve curricula. High school students are knowledgeable about the SAT. They get information from their peers and high school counselors who encourage them to do well on the examination so they can be admitted to the best schools or the schools of their choice. Among them are classroom preparation, taking the PSAT, which is a practice SAT, and parents financing specialized SAT preparation classes. Students can take the SAT many times (Coyle et al., 2011). The highest score is accepted. The test is used as part of the criteria for admissions. Many institutions accept minimum scores for admission. For example, more competitive institutions may require a combined score of at least 1100 SAT, while a less competitive school may accept students with a combined SAT

score of 800 (Rohr, 2012). Some schools do not require the submission of these test scores. Because scores on the SAT are prominently used in admissions decisions, the question becomes, what are schools looking for with the submission of these scores that could not be found in students' high school transcripts? Are these scores used as eliminators for admissions, or do the institutions use them to predict how successful these students will be during their college careers?

Statement of the Problem

The problem was to investigate the predictive validity of combined SAT scores on college graduate's grade point averages.

Purpose of the Study

The purpose of this study was to critically analyze the correlation between SAT scores students submitted on their admissions applications and their grade point averages when they graduated from college.

Significance of Study

This study is significant because of the information provided. This information consists of empirical and valid data. The Office of Admissions and Registrar can use these data to justify their criteria for student admission at the undergraduate level. These predictive validating data can be used to establish levels of successful student completion of undergraduate degree programs before these students begin working on their programs. Another benefit is that these data can be used for the prediction of the retention levels of a student, which is related to the admission issue.

Assumptions

The researcher made the following assumptions in conducting this study:

1. That the student's SAT scores are valid.
2. The basic focus of the undergraduate program will remain relatively stable over long periods of time.
3. The students admitted to the undergraduate level will continue to be highly motivated to work hard and continue their success rate consistently.
4. The students admitted have a sufficiently adequate level of intellectual ability to do college-level work.
5. The students will continue to receive appropriate instructions and skills from the university to help ensure the successful completion of their programs.

Limitations

The writer recognized certain limitations in performing this study and reminded readers to exercise precautions in generalizing these results to the general population. The limitations are as follows:

1. The data used were historical, which is typical of such studies.
2. The author could not control the sizes of the groups of scores; however, the general population was well-defined.
3. The author does not claim that these groups of scores represent a normally distributed population of undergraduate students.
4. The test scores were for select groups of students who sought admission to the University.
5. The information granted by the Office of Institutional Research only included the admission test score and GPA at graduation. Other pertinent information, such as high school involvement, background, and scholarship information, was not assessable.
6. The study will not account for individual differences and motivation of the students.

Review of Literature

In a review of the related literature, the writer carefully investigated the significance of the use of Scholastic Aptitude Test scores as they relate to African Americans and their usefulness for the admittance of African Americans to colleges and universities (Cimetta, D'Agostino, & Levin, 2010). Voluminous amounts of research have been conducted on the cultural biases found in the use of the SAT. That could preclude minority students, particularly African Americans, from ascertaining scores comparable to or higher than the dominant culture and other minorities (Zwick & Sklar, 2005). The rationale for choosing this research topic was to examine the research that has been conducted on the SAT; some may show it is culturally biased toward women and ethnic groups in spite of its continued use as a measure of achievement for all groups (Humphreys, 1968).

Because African American students' SAT scores are lower than other groups, the rate of their admission to chosen colleges can be limited. Does a low to moderate score on the SAT mean the students will likely be low to moderate achievers in college? Conversely, does this also mean that students scoring higher than 1000 on the SAT will have high levels of achievement in college? Many institutions begin the admissions process with the calculation of an Admission Index or an Eligibility Index, which is a transformation of a predicted freshman GPA based on a combination of SAT-verbal, SAT-math, and high school rank or GPA (Ware, 1998). Although the scores on these indexes can be used to flag promising students, all packets are usually considered individually, depending on the number of required courses taken, honor or advanced placement courses taken, grade trends, extracurricular activities, and special circumstances. The ultimate goal of the University and College admissions teams is to evaluate student application files and select students who will be successful at their institutions. The definition of success is not operationally defined or qualified (Mauger &

Kolmodin, 1975).

There is literature that supports the SAT and other data that found biases and poor predictive validity for the SAT. The SAT is often criticized, but it is one of the most widely used Standardized Tests in college admissions across the country. Another criticism of the use of the SAT in admissions predictions is whether the test is an achievement test with predictive validity. There have been opposing arguments on the issue concerning the use of the SAT in college admissions and its effectiveness. Humphreys (1968) concluded that the SAT could not predict grades after the freshman year, but a study by (Mauger & Kolmodin, 1975) found evidence that the test's validity is high enough to be of use in predicting how well a typical student would do during his college career. (Ware, 1998) found that high school ranks and SAT scores could be used to predict the cumulative GPA about the same as their first-year grade-point averages. While pursuing the question of the SAT biases (Zwick & Sklar, 2005), the College Board presented data from participants in the College Board Validity Study Service and concluded that, although females scored lower than males, the test was a better predictor of college performance for females than for males. Regarding ethnic differences, the author found that using the high school record and SAT scores over-predicted achievement for African students.

Methodology

The methodology used was historical in that data were gathered over a period of three years, namely, 2014, 2015 and 2016. The Pearson Product-Moment correlational technique was used to analyze the data. In the last test of the hypothesis, the t-test has been used to verify the significance of the relationship.

Population

The population consisted of three classes of graduated from the university during the academic years of 2014 to 2016. All students were classified as undergraduates. The majority of these persons were African Americans. Their general level of intellectual capability may be classified as average or above average. Their socioeconomic levels ranged from low- to middle class. Their chronological ages ranged from approximately 18-22.

Sample

A sample of subjects was drawn from each of these three classes. The composition of each sample consisted of 15 graduates, 15 graduates, and 20 graduates from 2014 to 2016, respectively. The writer did not claim the representativeness of any of these samples.

Analysis of Data

The total SAT Test scores and the final grade point averages of the baccalaureate degree recipients were correlated. The Spearman-Brown Rank Difference Coefficients were calculated for each group. This statistical technique was judged to be approximate because of the nature of the two sets of data. The 0.05 level of confidence was used as the decision rule.

The analysis of each set of data is presented separately, in tabular form, in the following sections. Table 1 contains the SAT Test scores and grade-point averages of the sample of students who graduated in 2014.

Table No. 1: Total SAT Test scores and grade point averages of the 2014 Baccalaureate class

Student No.	SAT	GPA
1	870	3.043
2	690	3.198
3	580	2.634
4	860	2.532
5	790	2.765
6	920	3.927
7	760	3.194
8	780	3.129
9	730	2.914
10	760	3.403
11	630	2.464

12	700	2.333
13	820	2.838
14	840	3.42
15	810	3.677

The total SAT Test scores ranged from 580 to 920 – and the grade point averages ranged from 2.5 to 3.9. The most salient feature of these data is the lack of a consistent pattern between the magnitude of SAT scores and grade point averages, e.g., the student that had the lowest total SAT score had a relatively high grade point average at graduation.

Table 2 contains the total SAT Test scores and grade point averages for the baccalaureate students in 2015.

Table No. 2: Total SAT Test scores and grade point averages of the 2015 Baccalaureate class

Student No.	SAT	GPA
1	670	2.231
2	680	2.336
3	890	3.458
4	720	3.762
5	610	2.833
6	850	3.195
7	640	2.8
8	790	2.924

9	960	3.354
10	1070	2.886
11	1040	3.813
12	630	2.632
13	750	3.328
14	800	3.608
15	790	3.321

The most salient feature of the data in Table 3 is the lack of a consistent pattern between the magnitude of the total SAT scores and the baccalaureate grade point averages of the 2015 class. For example, the highest total score SAT score is the opposite of relatively low-grade point averages. Other observations are the middle ranges between the highest and lowest SAT scores using the grade point averages, respectively.

Table three contains the total SAT Test scores and the grade point averages of the baccalaureate students in 2016.

Table No. 3: Total SAT Test scores and grade, point averages of the 2016 Baccalaureate class

Student No.	SAT	GPA
1	640	2.634
2	730	3.075
3	830	3.159
4	720	2.921
5	880	2.886

6	780	2.875
7	520	2.598
8	570	2.265
9	930	3.008
10	880	2.851
11	1060	2.919
12	850	2.877
13	450	2.729
14	710	2.251
15	610	3.614
16	370	2.291
17	740	2.492
18	870	3.768
19	790	2.976
20	640	2.302

Table four contains a summary of the findings.

Table No. 4: Summary of Findings

Class	N	Items	RHO
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2014	15	Total SAT with GPA	0.1182
2015	15	Total SAT with GPA	0.6614 *
2016	20	Total SAT with GPA	0.5773 **

*PL 0.05 **PL 0.01

The Spearman rank-order correlation of 0.6614 for the 2015 graduates was statistically significant beyond the 0.05 level of confidence. A similar correlation of 0.5573 for the 2016 graduates was statistically significant beyond the 0.01 level of confidence. The author determined the coefficient of alienation for each correlation coefficient because of her interest in establishing predictive validity. The coefficients of alienation are presented in Table 5.

Table No. 5: Coefficients of Alienation

Class	N	Rank Difference	Alienation
2014	15	0.1182	0.986
2015	15	0.6614	0.5626
2016	20	0.5773	0.6667

Although statistically significant correlation coefficients were found for the 2014 and 2016 classes, the coefficients of alienation were 0.56 and 0.66, respectively. It means that accurate predictions could not be made because too many of the predictive variables are not used in the predictions.

Regression Analysis:

$$Y = \beta_0 + \beta_1 X + e$$

In the above model, β_0 is the constant of the model, which is not affected by the change in the independent variable. Where β_1 is the slope of the model that is being changed with the change in every unit of the independent variable. The calculated regression line is as follows. GPA is taken as the dependent variable, and the SAT scores are taken as the independent variable.

$$y = 0.0134x + 2.9239$$

From the above equation, one score increase in the SAT will cause an increase of 0.031 points in GPA and vice versa. There is a weak relationship among the variables.

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.858	1	.858	5.434	.036 ^b
	Residual	2.053	13	.158		
	Total	2.911	14			
a. Dependent Variable: GPA						
b. Predictors: (Constant), SAT						

Testing of Hypothesis

H_0 : There is a significant relationship between the SAT scores and GPA of the students

H_1 : There is no significant relationship between the SAT scores and GPA of the students

Using the Microsoft Excel Package, the calculated value of T-Test = 2.331, which is greater than 0.05, which means that the null hypothesis is rejected and both the estimates of the populations have a non-significant relationship with each other. It means that the students will higher SAT scores do not necessarily have higher GPAs in their graduate degree program.

Result Summary

The findings derived from the data obtained from this study were as follows;

1. A Spearman rank difference correlation coefficient of 0.11 was found between the SAT total test scores and the grade point averages for the baccalaureate class of 2015.
2. A similar type of correlation coefficient of 0.6614 was found for the baccalaureate class of 2015.
3. Another similar type of correlation coefficient of 0.5773 was found for the baccalaureate class of

2016.

Discussion

Many African-American students want to go to college after high school. Some African-American students become sidetracked. For them, college is not the next step. However, those who wish to continue may find college selection stressful and time-consuming in light of their SAT results, which may determine the type of postsecondary institution they select by limiting their choices. Since all institutions want students to reach their maximum potential and succeed, a base score is used to accept or deny entrance to the institution. Much research supports the concern that the SAT does not accurately predict the college achievement of African American students. We must then question why it is used. The data collected for this study show that although there is a typical minimum score for admission, a majority of the students admitted to the university have scored far below that mark. The students who have been admitted with combined scores below 800 have successfully matriculated through The University with grades similar to those admitted with combined scores of 800 and above. Did the scores accurately predict the student's success? A high admission test score would ideally suggest that the student will excel at the institution. Conversely, a lower admission score would equate to lower achievement and possibly dropping out.

As we pointed out previously, the SAT has been criticized because it may discriminate unfairly against minority groups within a culture. Test developers have responded to this criticism by constructing tests that purport to be "Culture-Fair," which means that words and facts that are culturally linked have been eliminated. Consequently, most of these tests do not require the subjects to use language.

Conclusion

The findings derived from a careful analysis of the data obtained from this study seem to warrant the following conclusions:

1. A real positive correlation existed between one of the admissions criteria. Namely, the total SAT scores and the grade point averages of the baccalaureate class of 2015.
2. A similar positive correlation existed between the total SAT scores, used as one of the admissions criteria, and the grade point averages of the baccalaureate class of 2016.
3. No statistically significant correlation existed between the total SAT scores, used as an alienation criterion, and the grade point averages of the baccalaureate class of 2015.

Implications

The conclusions drawn from the findings of this study seem to warrant the following implications:

1. There are sufficient similarities between what the SAT Test measures and what the undergraduate curricula provide to warrant the use of the SAT Test as a criterion of admission to the University.
2. That the statistically significant correlations found between the total SAT Test scores and the grade point averages of the baccalaureates of 1996 and 1997 may reflect recent revisions of the content, normalization, and standardization of the SAT Test to make it more appropriate for African-American students.
3. That the curriculum may have been modified and updated to reflect the effects of newer and more relevant knowledge students are learning.
4. The teacher may have changed their teaching styles, and the effects may be manifested in students' performance on the SAT and baccalaureate degree programs.

Recommendations

The implications inherent in the conclusions drawn from the findings of this study seem to warrant the following recommendations:

1. More carefully designed research studies should be made to check the empirical validity of the correlation between students' SAT Test scores and baccalaureate degree grade point averages.
2. Those studies cover wider spans of time.
3. A more careful analysis is made of the criteria instruments' content and curricular content of baccalaureate degree programs to determine their congruency.

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